Remarks

Claims 1 - 8 and 10 are pending. Favorable reconsideration is respectfully requested.

Claims 1 - 5 have been rejected under 35 U.S.C. § 103(a) as unpatentable over JP 2000-86227 ("*JP '227*") interpreted from an abstract of unknown source, supplied by the Office. Applicants respectfully traverse this rejection. The claims require supplying non-premixed combusting gas and non-premixed combustible gas to a plurality of combusting and non-combusting gas passageways in a geometric array.

JP '227 does not disclose that the gases are not premixed, nor does *JP '227* disclose a plurality of non-combusting and combusting passageways. The Office states that "The gases used . . . do not appear to be mixed with any other substance and therefore are held to meet the "non-premixed" limitations . . ." It is well established that a reference is good only for what it clearly and unambiguously discloses. *In re Noreton*, 129 USPQ 227, 230 (CCPA 1961); *In re Hughes*, 145 USPQ 467, 471 (CCPA 1965), and any uncertainty in a reference's teaching must be resolved in favor of the Applicant. *In re Sheppard*, 144 USPQ 42 (CCPA 1964). A <u>non-disclosure</u> is not a disclosure. The *JP '227* reference says <u>nothing</u> about the arrangement of gas channels and nothing about premixing. Therefore, it cannot anticipate the claims.[1]

The Office states that the arrangement of passageways are apparatus limitations. this is true only in part. Since the claim requires combustible and non-combustible gas to be fed to these passageways, each present in a plurality, these limitations are process limitations as well. Moreover, it is well known that apparatus limitations in a process claim <u>must</u> be

[1] The Office should also note the definition of non-premixed at the top of page 12 of the specification. This term means that the combusting and combustible gases are not mixed to their combustible limit. It does not mean that other substances (ceramic precursors, etc.) cannot be mixed with either gas.

considered when assessing patentability if the apparatus limitations affect the method in a manipulative sense, as they do here, *Ex parte Pheiffer*, 135 USPQ 31 (POBA 1961), and if they affect the outcome of the process. Not to consider these limitations would defeat the mandate of the Federal Circuit and the U.S. Supreme Court that the claims must be viewed as a whole.

As Applicants have indicated throughout their specification, the arrangement of burner passageways, for example as described on pages 7 - 8, particularly at the top of page 8, which define a multi-element diffusion flame burner, is necessary to obtain the results achieved. This unique burner configuration results in a highly uniform flame front temperature gradient, which creates products not capable of being produced by other burners not so configured. *See, e.g.* page 14, lines 9 - 16 and page 33, line 16 to page 34, line 6, the latter passages describing the difference in products obtained by other burners as opposed to the present invention.

For all of the above reasons, withdrawal of the rejection of the claims over *JP '227* is solicited.

Claims 1 - 5, 8, and 10 have been rejected under 35 U.S.C. § 103(a) as unpatentable over Glumac et al. U.S. Patent 5,876,683 ("*Glumac*").

The claimed process requires supplying <u>non</u>-premixed combusting and combustible gases to their respective passageways. *Glumac* is the direct opposite of what is claimed. *Glumac* teaches supplying a "combustion gas" which is a <u>mixture</u> of combustible gas and combusting gas, as indicated at column 4, lines 20 - 27. This <u>premixed</u> combustion gas is fed to combustor 17 through supply line 21. Note there is only one supply line (19 and 20 are for water cooling), so the combusting gas and combustible gas must be mixed, otherwise they could not burn, particularly at the low pressure in chamber 11 (1-50 mbar). Since *Glumac* does not teach or suggest using non-premixed combusting and combustible gases, fed to the

burner through a plurality of separate passageways, but instead teaches the opposite, the rejection over *Glumac* must be withdrawn.

Since the application was filed, the inventor and coworkers have made additional unique compositions employing a MEDFB, for example SnO_2 nanorods and gold nanoparticles encapsulated by SnO_2 nanoparticles. A page describing such is attached hereto on the page following the signature page of this document. No PTO 1449 form is attached, since the attached page is not prior art, but is further evidence of the uniqueness of Applicants' invention.

Applicants submit that the claims are now in condition for Allowance, and respectfully request a Notice to that effect. If the Examiner believes that further discussion will advance the prosecution of the Application, the Examiner is highly encouraged to telephone Applicants' attorney at the number given below.

A check in the amount of $ 225.00 is enclosed to cover the Petition fee. Please charge any additional fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

Respectfully submitted,

MARGARET S. WOOLDRIDGE ET AL.

By ______________________

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Date: June 9, 2006

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Attachment

Comparison of tin dioxide nanoparticles generated using different combustion approaches

Prepared by M. S. Wooldridge

In the following sections, examples of tin dioxide (SnO_2) nanoparticle materials synthesized using a variety of combustion synthesis approaches are presented. A comparison of the materials demonstrates the unique nanocrystalline rod and encapsulation morphologies that can be obtained using the approach developed by Wooldridge and co-workers. A schematic of the synthesis facilities used by each group is provided for reference.

Wooldridge and co-workers

We have demonstrated the *first* flame synthesis of tin dioxide *nanorods*. These materials have high aspect ratios and have *never* been synthesized using a combustion method prior to our work. These materials have potential to dramatically improve gas-sensor performance as well as application as highly efficient low-temperature catalysts.

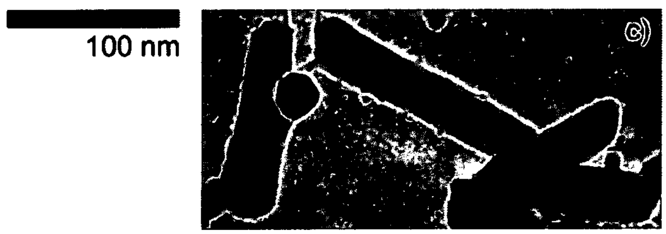

Figure 1. SnO_2 nanorods synthesized by the Wooldridge group using the multi-element diffusion flame burner facility[1].

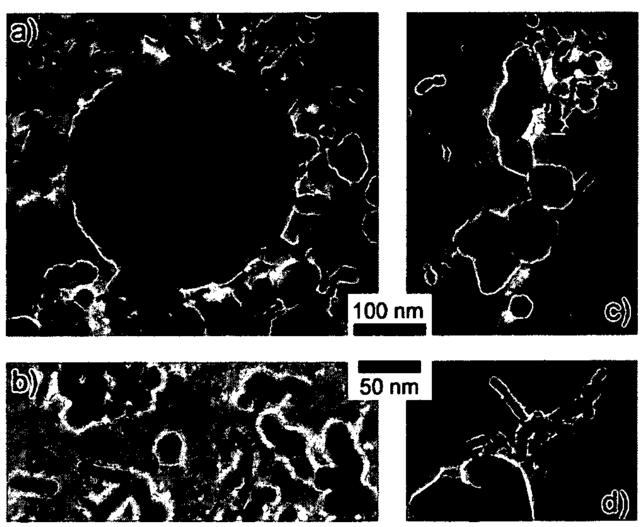

Figure 2. Gold nanoparticles encapsulated by a layer of SnO_2 nanoparticles and additional SnO_2 nanorods synthesized by the Wooldridge group using the multi-element diffusion flame burner[1].

[1]Bakrania, S. D., Perez, C., and Wooldridge, M. S., "Methane-assisted combustion synthesis of nanocomposite tin dioxide materials" submitted to the *Proceedings of the Combustion Institute*, December 2005; accepted April 2006.